

Non-Weather Related Emergency Products Specification

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1. **Introduction.** This procedural directive describes NWS support of hazardous releases and homeland security and non-weather related emergency products issued by the National Center for Environmental Prediction Center (NCEP) and National Weather Service Weather Forecast Offices (WFOs).

2. **NWS Support of Hazardous Releases and Homeland Security.**

2.1 **Mission Connection.** Recent events including terrorist incidents, accidental releases of hazardous materials into the atmosphere, and the potential use of weapons of mass destruction have resulted in enhanced coordination and revamping of the Federal Response Plan and Federal Radiological Emergency Response Plan under the Federal Emergency Management Agency (FEMA, plans available at <http://www.fema.gov/r-n-r/frp/>). NWS contribution of meteorological expertise is a critical element in those plans. NWS is a major provider of weather information to emergency responders and other government agencies including observations, forecasts and warnings, and model interpretation. To enhance and protect public safety, NWS Weather Forecast Offices (WFO) should work closely with the emergency management community to provide decision makers with the appropriate weather information.

2.2 **Atmospheric Dispersion Models.** Although there are several public agencies involved with atmospheric transport and dispersion (ATD), NWS is the primary agency for realtime meteorological expertise and NCEP model guidance 24 hours a day. NWS has developed links with the ATD community to serve an array of users from local first responders and emergency managers to large agencies such as Environmental Protection Agency (EPA), Department of Defense (DOD), Federal Emergency Management Agency (FEMA), and Department of Energy (DOE).

NWS observations and forecasts including NCEP models provide input to a variety of ATD models such as the NOAA/National Ocean Service Computer-Aided Management of Emergency Operations (CAMEO) model, and NOAA/Air Resources Laboratory Hybrid Single-Particle Lagrangian Integrated Trajectory (HYSPLIT) model and Volcanic Ash Forecast Transport and Dispersion (VAFTAD) model. NCEP meteorological models as well as DOD models are used to initiate and run other ATDs such as the Defense Threat Reduction Agency (DTRA) Hazard Prediction and Assessment Capability (HPAC) model and Department of Energy Atmospheric Release Advisory Capability (ARAC) model.

2.3 **Small Scale, Short Duration Releases.** For small scale (0-10 km), short duration (less than one hour) releases, many local jurisdictions including emergency responders use a dispersion software package developed by National Ocean Service (NOS) and Environmental Protection Agency (EPA) called CAMEO.

2.3.1 **WFO Support.** WFOs may be asked to provide a site-specific observation or estimate, but generally responders use the nearest observation or take an on-site observation and enter the information into the model. A technical description of CAMEO is provided in Appendix A.

2.4 Large Atmospheric Release. In the event of a large atmospheric release (10 km or greater may be smaller in light wind regime) of some chemical, biological or radioactive contaminant, (greater than an hour duration), an emergency manager may call the WFO and request atmospheric transport and dispersion information.

2.4.1 WFO Support. The senior forecaster on duty should perform the following steps when providing atmospheric transport and dispersion information:

- a. Obtain appropriate information such as location, size and/or height of release, and who/how to contact.
- b. Call the Senior Duty Meteorologist at NCEP, e-mail: sdm@noaa.gov.
- c. After contact, the SDM will submit the HYSPLIT model and post the results to the secure web site (see Figure 1).

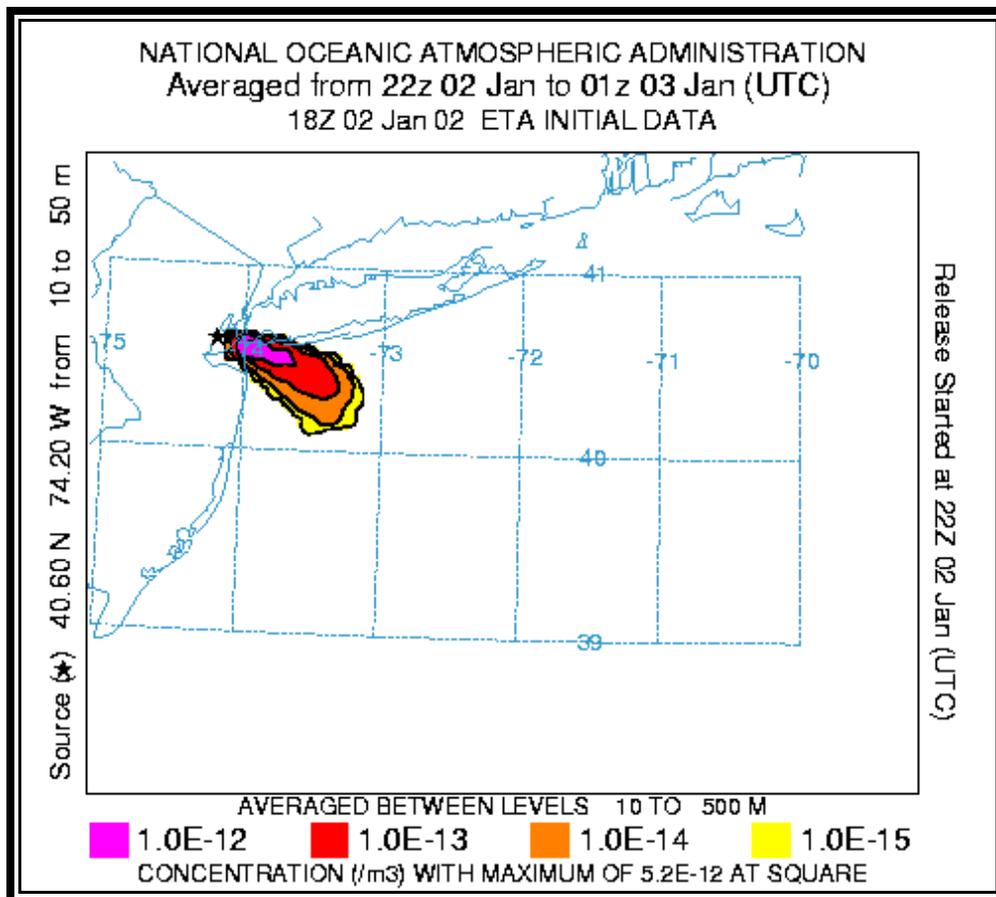


Figure 1. Sample Dispersion Output from HYSPLIT.

2.5 Procedures for using HYSPLIT Dispersion Model for Familiarization and Hazardous Releases.

2.5.1 Routine Access to HYSPLIT. A web site hosted by NCEP provides real-time access to HYSPLIT output for about 15 changeable locations across the CONUS. The output is based on the 12 km Eta model that is run four times daily and posted on the NCEP web site. See your regional Meteorological Services Division for access.

Only sites that have submitted their individual PC IP addresses will be able to access the secured server. Additional IP addresses may be submitted to OS22- Fire and Public Weather Services Branch.

2.5.2 Emergency Request. When a WFO is informed of an atmospheric release and asked for a dispersion forecast, usually by an emergency manager or another federal agency such as the Nuclear Regulatory Commission (NRC), the forecaster should perform the following steps:

- a. Obtain appropriate information such as specific location (latitude and longitude or nearby airport), size and/or height of release, and an identifier for the incident (set by requestor or SDM).
- b. Call the Senior Duty Meteorologist at NCEP , e-mail: sdm@noaa.gov.
- c. After contact, the SDM will run the HYSPLIT model and post the results to the secure web site.
- d. The output will be made available on the NCEP secure web site within 10-15 minutes.
- e. The forecaster should coordinate with the requestor how the output will be disseminated (fax, FTP, e-mail attachment, etc.).
- f. Click on the day you want to view, then the state (or specific ID) and run time for GIF or Geographical Information System (GIS) downloads. The experimental GUI also contains Postscript (PS) files, compressed GIS files in TAR format, and ability to loop GIF files.

2.5.3 Alternate Access to HYSPLIT. A non-operational ARL Web Site can be used to access HYSPLIT output run at lower resolution (>40km) for locations worldwide with user input (location, source height, meteorological model, etc.). The alternate web site is: <http://www.arl.noaa.gov/ready/hysplit4.html>.

At the web site perform the following steps:

- a. Click on "Registered User Login" ("noaa.gov" IP address is required)

- b. Under Dispersion Model click "Compute Concentrations"
- c. Use the pull down menu for forecast data and choose a model, i.e. ETA Model (ETA 40KM)
- d. Choose an ID or input a Lat/Lon and click "NEXT"
- e. In the model information section use all default values EXCEPT choose a value for "Total Run (Hours)," i.e. 24 hours and a "Start Time (UTC)" hour closest to the radiological release time.
- f. At the bottom of the page click "Request Dispersion Run"
- g. After a minute or two, Click "HYSPLIT Run Results" The model may take up to 3-5 minutes to run.
- h. View the output by clicking on Concentration or Deposition results at the bottom of the page

2.5.4 WFO HYSPLIT Testing. All WFOs will run annual drills and occasional tests to ensure forecasters can access HYSPLIT output from the secure NCEP web site. Forecasters should become familiar with procedures to request and access special HYSPLIT model runs in the event of a real emergency. Output will be posted four times daily for 15 or more sites throughout the country so WFOs will be able to select a familiar or nearby site as appropriate.

To test system viability and operational readiness, OS22 will coordinate testing periodically at specific sites with prior notification of the responsible WFO. MSDs and MICs should inform OS22 of any conflicts or local critical needs that may allow local offices to opt out of a test and may alter the schedule according to local needs. By spreading out access over a period of several weeks, delays in contacting the SDM or web site and downloading data will be minimized. However, any office may access the web site at any time. Any problems should be noted and relayed to the SDM. Comments, concerns, issues, etc. may be sent to OS22.

3. **Fallout Winds (product category FOF).** Fallout Winds are produced in support of interagency homeland security and emergency response activities as outlined in the Federal Response Plan. Primary users are Environmental Protection Agency (EPA) and Federal Emergency Management Agency (FEMA).

3.1 Mission Connection. NCEP Central Operations (NCO) uses program DFWINDSX within the AVN model job suite to generate bulletins of forecast Fallout Winds. In the event that NCEP Fallout Winds are unavailable and an emergency exists, WFOs with collocated or nearby upper air sites will calculate vector winds using the sounding data as outlined in FMH#5.

3.2 Issuance Guidelines.

3.2.1 Creation Software. NCO uses the DFWINDSX program within the AVN model job suite to generate bulletins of Fallout Winds.

3.2.2 Issuance Criteria. Fallout Winds are routine, schedule-driven products and are produced twice daily based on the 0000 and 1200 UTC AVN runs.

3.2.3 Issuance Time. Fallout Winds are issued daily at approximately 0415 UTC and 1625 UTC.

3.2.4 Valid Time. Fallout wind vectors are calculated for six-hourly periods out to 24 hours from 0000 UTC and 1200 UTC.

3.2.5 Product Expiration Time. The products are valid until they are superseded by subsequent runs every 12 hours.

3.2.6 Event Expiration Time. Not applicable.

3.3 Technical Description. Fallout Winds product should follow the format and content described in this section.

3.3.1 Universal Geographic Code Type. Not applicable.

3.3.2 Mass News Disseminator Broadcast Instruction Line. Not applicable.

3.3.3 Mass News Disseminator Product Type Line. Not applicable.

3.3.4 Content. The fallout wind vectors are produced for 133 sites in four text bulletins—FDAK01 (Alaska); FDCA01 (Caribbean); FDHI01 (Hawaii/Pacific); FDUS01 (CONUS). Three vectors (ddss; direction and distance from site) are generated representing a triangular pattern of particle deposition expected within 3 hours of the release. A sample plot of the three vectors and the fallout pattern “footprint” is show in Figure 2.

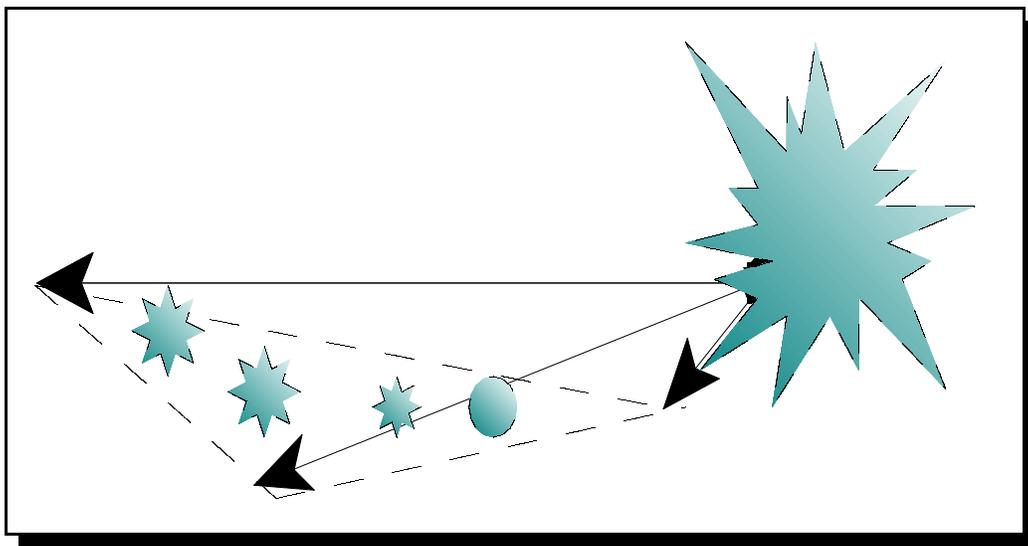


Figure 2. Footprint of Fallout (dashed line: T+3 hours)

3.3.5 Format.

<u>Product Format</u>	<u>Description of Entry</u>
FDaaii KWNO ddhmm	<i>(WMO Header)</i>
DATA BASED ON 211200Z	<i>(Data Information Line)</i>
region1	<i>(Region the information applies)</i>
iii ddss ddss ddss	<i>(iii = 3-letter or number site identifier)</i>
iii ddss ddss ddss	<i>(dd = true direction, in tens of degrees clockwise</i>
iii ddss ddss ddss	<i>from true north on the scale 01 to 36, toward</i>
<i>(info repeats until next region)</i>	<i>which particles would fall from 100 mb level)</i>
region2	<i>(ss = distance, in tens of statute miles from the</i>
iii ddss ddss ddss	<i>station, at which particles take 3 hours to fall to</i>
<i>(etc.)</i>	<i>the ground from 100 mb (or specific level).</i>

Table 1. Generic format for a Fallout Winds product.

When local computations are made based on the sounding data and the sounding ends below 100 mb (60,000 ft.), the ddss group will include a fifth digit hddss where h=height of the highest sounding level, in ten thousands of feet, either 30,000 ft (h=3), 40,000 ft(h=4), or 50,000 feet (h=5). If a sounding terminates below 30,000 ft., no fallout winds can be calculated.

EPA and other users plot the vectors on their own maps or input to their own models. EPA will issue appropriate public information releases when nuclear debris is injected into the atmosphere and is expected to impact the United States and/or its territories.

3.4 Updates, Amendments, and Corrections. Fallout Winds are not updated or amended. Corrections are issued when necessary.

4. **Earthquake Reports (product category EQR).** Weather Forecast Offices (WFOs) issue EQRs to disseminate macroseismic (“felt”) earthquake information to the United States Geological Survey’s (USGS) National Earthquake Information Center (NEIC), the West Coast/Alaska Tsunami Warning Center (WC/ATWC), the Pacific Tsunami Warning Center (PTWC), other partners, and customers.

4.1 Mission Connection. NWS offices issue information received on earthquakes occurring within the United States, Guam, American Samoa, the Federated States of Micronesia, the Republic of Palau, and the Republic of the Marshall Islands. This information is disseminated to both the public and the United States Geological Survey’s (USGS) National Earthquake Information Center (NEIC), located in Golden, Colorado.

The NEIC collects both descriptive and specific technical information to determine the various earthquake parameters and issues statements and bulletins for earthquakes occurring both domestically and around the world. The WC/ATWC and the Richard H. Hagemeyer Pacific Tsunami Warning Center (PTWC) serve as supporting seismological observatories to the NEIC

in addition to their primary function as NWS tsunami warning centers. Both are responsible for determining if an earthquake is of a magnitude with the potential to generate a tsunami, determine if a tsunami has been generated, and if so, (1) issuing appropriate warnings and (2) disseminating appropriate earthquake/tsunami information.

4.2 Issuance Guidelines. EQRs should be disseminated on the NOAA Weather Wire Service (NWWS) and Automated Weather Information Processing System (AWIPS). Unique reporting procedures are described below for NWS offices in four broad areas:

- a. WFOs in the Contiguous United States (except the West Coast) and Puerto Rico. NWS Weather Forecast Offices (WFO) in this area should disseminate Earthquake Reports (EQR) for Mercalli Intensity IV or greater earthquakes (see Table 2 for details on the Mercalli Scale). Once more precise, quantitative seismic information is received from the NEIC it will be incorporated into an updated EQR. WFOs in the felt area of the earthquake (within their geographic area of responsibility) should broadcast EQRs on appropriate NOAA Weather Radio (NWR) transmitters.
- b. WFOs on the West Coast of the United States. Offices in this region should initially disseminate Earthquake Reports (EQR) with felt information only for Mercalli Intensity IV or greater earthquakes. Once more precise, quantitative seismic information is received from either the NEIC (for earthquakes less than 6.0 on the Richter Scale) or the WC/ATWC (EQIWOC for earthquakes 6.0 or greater on the Richter Scale) it will be incorporated into updated EQRs. WFOs in the felt area of the earthquake (within their geographic area of responsibility) should broadcast EQRs on appropriate NWR transmitters.
- c. WFOs and Weather Service Offices (WSOs) in Alaska. NWS offices in the Alaska Region should disseminate Earthquake Reports (EQR) with felt information only for Mercalli Intensity IV or greater earthquakes. This preliminary EQR should not be broadcast over NWR in coastal areas as it could trigger unnecessary evacuations. As time/workload permits, NWS offices in this region should also submit felt information to the WC/ATWC at <http://wcatwc.arh.noaa.gov/reportformb.htm>.
- d. NOTE: The WC/ATWC disseminates Earthquake Information Statements (EQIAKX) for earthquakes in Alaska of a magnitude 5.0 or greater on the Richter Scale. This information may be broadcast on NWR transmitters in the “felt area” as a public service. **NWS offices in Alaska will not redistribute this information in an updated EQR.**
- e. WFOs, WSOs, and Data Collection Offices (DCOs) in Pacific Region. WFOs in Hawaii and Guam; WSOs in American Samoa, the Federated States of Micronesia, the Republic of Palau, and the Republic of the Marshall Islands, and DCOs in Hawaii should only disseminate preliminary EQRs for Mercalli Intensity IV or greater earthquakes. EQRs should not be broadcast over NWR.

NOTE: PTWC disseminates Earthquake Information Statements for Hawaii (EQIHWX) for earthquakes occurring in Hawaii of a magnitude 4.5 or greater on the Richter Scale and Tsunami Information Bulletins for earthquakes 6.5 or greater in its AOR that do not produce tsunamis. This information may be broadcast on NWR transmitters in the “felt area” as a public service. **Pacific Region offices will not issue updated EQRs with this information.**

Scale	Mercalli Intensity Scale Description
I.	Not felt except by a very few under especially favorable circumstances.
II.	Felt only by a few persons at rest, especially on upper floors of buildings. Delicately suspended objects may swing.
III.	Felt quite noticeably indoors, especially on upper floors of buildings, but many people do not recognize it as an earthquake. Standing motorcars may rock slightly. Vibration like passing truck. Duration estimated.
IV.	During the day felt indoors by many, outdoors by few. At night some awakened. Dishes, windows, and doors disturbed; walls make creaking sound. Sensation like heavy truck striking building. Standing motorcars rocked noticeably.
V.	Felt by nearly everyone; many awakened. Some dishes, windows, etc. broken; a few instances of cracked plaster; unstable objects overturned. Disturbances of trees, poles, and other tall objects sometimes noticed. Pendulum clocks may stop.
VI.	Felt by all; many frightened and run outdoors. Some heavy furniture moved; a few instances of fallen plaster or damaged chimneys. Damage slight.
VII.	Everybody runs outdoors. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable in poorly built or badly designed structures. Some chimneys broken. Noticed by persons driving motorcars.
VIII.	Damage slight in specially designed structures; considerable in ordinary substantial buildings, with partial collapse; great in poorly built structures. Panel walls thrown out of frame structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned. Sand and mud ejected in small amounts. Changes in well water. Persons driving motorcars disturbed.
IX.	Damage considerable to specially designed structures; well-designed frame structures thrown out of plumb; great in substantial buildings, with partial collapse. Buildings shifted off foundations. Ground cracked conspicuously. Underground pipes broken.
X.	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations; ground badly cracked. Rails bent. Landslides considerable from river banks and steep slopes. Shifted sand and mud. Water splashed (slopped) over banks.

XI.	Few, if any (masonry) structures remain standing. Bridges destroyed. Broad fissures in ground. Underground pipelines completely out of service. Earth slumps and land slips in soft ground. Rails bent greatly.
XII.	Damage total. Waves seen on ground surfaces. Lines of sight and level distorted. Objects thrown upward into the air.

Table 2. Modified Mercalli Intensity (Damage) Scale of 1931.

(NOTE: This is considered to be a classical scale similar to the Beaufort Scale. Thus a more modern version has not been developed.)

4.2.1 Creation Software. EQRs are generated in the AWIPS text editor or other text editor software (e.g., AFTN/MET at Pacific Region WSOs).

4.2.2 Issuance Criteria. The EQR is a non-routine, event-driven product. EQRs should be issued using the following guidelines:

- a. Earthquakes of Intensity IV or greater on the Modified Mercalli Scale (see Table 2 for details) should be reported in accordance with the provisions specified in section 4.2a-d.
- b. EQR information should be factual and validated, if possible.
- c. EQRs should be in plain language, avoiding abbreviations and local jargon and place names.
- d. NWS personnel should confirm with the NEIC that the event was an earthquake before disseminating the EQR. If desired, confirmation may be obtained by calling the NEIC duty seismologist at 303-273-8427/8428 (24-hour). Earthquake confirmation is recommended when it is not clear whether the shaking was caused by an earthquake or something else, such as quarry blast, sonic boom, etc.

4.2.2.1 Earthquakes at WFOs. In addition to EQR responsibilities outlined above, the USGS/NEIC has requested NWS offices submit a web-based earthquake report immediately (or as soon as an Internet connection can be established) to them at:

http://pasadena.wr.usgs.gov/shake/cus/html/unknown_form.html for any Mercalli Intensity Level V (see criteria above) or greater earthquake:

The report should be submitted for earthquakes that are of sufficient strength at local NWS field offices to knock objects off shelves, displace appliances, crack glass, or be perceived as strong enough to be alarming. Such earthquakes are substantially less frequent than earthquakes that are merely felt. If the earthquake makes a strong impression on the people or significantly displaces objects in a WFO, NEIC would like the questionnaire. If there is doubt as to whether the earthquake was sufficiently strong to merit completion of a questionnaire, field personnel can assume no report is needed.

In the event of a major earthquake swarm or aftershock sequence, in which it is impractical to report every felt shock, report the stronger shocks. These would typically be no more than

several a day. Although optional, NEIC requests personnel at WFOs identify themselves to lend more credence to the web-based report.

4.2.3 Issuance Time. EQRs are transmitted as soon as reliable information is received indicating an earthquake has occurred.

4.2.4 Valid Time. EQRs are valid upon transmission.

4.2.5 Product Expiration Time. Product expires with the next issuance.

4.3 Technical Description. EQRs will follow the format and content described in this section.

4.3.1 Universal Geographic Code Type. Not applicable.

4.3.2 MND Broadcast Line. Not applicable.

4.3.3 MND Header. The MND Headers for the EQR are “EARTHQUAKE REPORT...PRELIMINARY” and “EARTHQUAKE REPORT...UPDATED”.

4.3.4 Content. With the exceptions noted below, each EQR should have the following general elements and format depending on whether it is a preliminary or an updated report:

4.3.4.1 Preliminary Earthquake Report. Until official information can be obtained from the USGS/NEIC, WC/ATWC, or PTWC, NWS offices will send out qualitative messages:

EARTHQUAKE FELT _____ BY _____ IN _____. _____ DAMAGE _____.
(a) (b) (c) (d) (e)

(a) VERY STRONGLY, STRONGLY, MODERATELY, WEAKLY

(b) (single) OBSERVER, FEW, MANY, etc.

(c) Give locality or localities

(d) CONSIDERABLE, MODERATE, SLIGHT, NO

(e) Give brief description of damage, e.g., CHIMNEYS BROKEN, TOWERS FELL, STRUCTURES DESTROYED, WALLS CRACKED, DISHES RATTLED, BUILDING SHIFTED, CASUALTIES.

In addition, NWS offices will add the following statement at the end of a preliminary Earthquake Report depending on their location:

CONUS:

INFORMATION RELEASED IN THIS STATEMENT IS PRELIMINARY. UPDATES... INCLUDING RICHTER SCALE MAGNITUDE... WILL BE PROVIDED AS MORE INFORMATION BECOMES AVAILABLE FROM THE NATIONAL EARTHQUAKE INFORMATION CENTER IN GOLDEN, COLORADO.

Alaska and Pacific Region:

INFORMATION RELEASED IN THIS STATEMENT IS PRELIMINARY. OFFICIAL INFORMATION, INCLUDING EARTHQUAKE LOCATION AND RICHTER SCALE MAGNITUDE, WILL BE PROVIDED BY THE WC/ATWC, (or PTWC, as appropriate) AS IT BECOMES AVAILABLE.

NOTE: Official information will be disseminated by the WC/ATWC or PTWC via Earthquake Information Statements. These statements will serve as the update to the preliminary EQR and may be broadcast over the NWR. Alaska and Pacific Region offices will not redistribute this information in an updated EQR.

4.3.4.2 Updated Earthquake Report. (NOTE: Applicable to only CONUS offices.) Once official quantitative information is received from the USGS/NEIC or WC/ATWC (for Washington, Oregon, and California for Richter Scale 6.0 or greater earthquakes), NWS offices should incorporate it in an updated EQR :

EARTHQUAKE FELT _____ BY _____ IN _____. _____ DAMAGE _____.
(a) (b) (c) (d) (e)

- (a) VERY STRONGLY, STRONGLY, MODERATELY, WEAKLY
- (b) (single) OBSERVER, FEW, MANY, etc.
- (c) Give locality or localities
- (d) CONSIDERABLE, MODERATE, SLIGHT, NO
- (e) Give brief description of damage, e.g., CHIMNEYS BROKEN, TOWERS FELL, STRUCTURES DESTROYED, WALLS CRACKED, DISHES RATTLED, BUILDING SHIFTED, CASUALTIES.

THE NATIONAL EARTHQUAKE INFORMATION CENTER IN GOLDEN COLORADO (or WC/ATWC, as appropriate) **INDICATED THE EARTHQUAKE MAGNITUDE (#) ON THE RICHTER SCALE WAS CENTERED AT** (lat/lon) **OR ABOUT** (miles) (direction) **OF** (city, state).

CONUS offices will add the following statement at the end of an updated Earthquake Report:

ANY FURTHER INFORMATION WILL BE MADE AVAILABLE WHEN IT IS RECEIVED FROM THE NATIONAL EARTHQUAKE INFORMATION CENTER IN GOLDEN COLORADO (or WC/ATWC, as appropriate).

4.3.5 EQR Generic Format.

<u>Product Format</u>	<u>Description of Entry</u>
SEaaii cccc ddhhmm EQRxxx	(WMO Heading) (AWIPS ID)
EARTHQUAKE REPORT...PRELIMINARY NATIONAL WEATHER SERVICE city state time am/pm time_zone day mon dd yyyy	(Product Name or MND) (Issuing Office) (Issuance time/date)
"EARTHQUAKE FELT _____ BY _____ IN _____. _____ DAMAGE _____."	(REQUIRED ENTRY - Refer to Section 4.3.4.1)
[Remainder of text]	
INFORMATION RELEASED IN THIS STATEMENT IS PRELIMINARY. UPDATES... INCLUDING RICHTER SCALE MAGNITUDE... WILL BE PROVIDED AS MORE INFORMATION BECOMES AVAILABLE FROM THE NATIONAL EARTHQUAKE INFORMATION CENTER IN GOLDEN COLORADO.	(REQUIRED ENTRY - End of Product)
\$\$	(UGC Delimiter)
Name/Initials/Forecaster ID	(Optional)

Figure 3. Generic format for a Preliminary Earthquake Report in the CONUS.

<u>Product Format</u>	<u>Description of Entry</u>
SEaaii cccc ddhhmm EQRxxx	(WMO Heading) (AWIPS ID)
EARTHQUAKE REPORT...PRELIMINARY NATIONAL WEATHER SERVICE city state time am/pm time_zone day mon dd yyyy	(Product Name or MND) (Issuing Office) (Issuance time/date)
"EARTHQUAKE FELT _____ BY _____ IN _____. _____ DAMAGE _____."	(REQUIRED ENTRY - Refer to Section 4.3.4.1)
[Remainder of text]	
INFORMATION RELEASED IN THIS STATEMENT IS PRELIMINARY. OFFICIAL INFORMATION, INCLUDING EARTHQUAKE LOCATION AND RICHTER SCALE MAGNITUDE, WILL BE PROVIDED BY THE WC/ATWC (or PTWC, as appropriate) AS IT BECOMES AVAILABLE.	(REQUIRED ENTRY - End of Product)
\$\$	(UGC Delimiter)
Name/Initials/Forecaster ID	(Optional)

Figure 4. Generic format for a Preliminary Earthquake Report in Alaska or Pacific Region.

<u>Product Format</u>	<u>Description of Entry</u>
SEaaii cccc ddhhmm EQRxxx	(WMO Heading) (AWIPS ID)
EARTHQUAKE REPORT...UPDATED NATIONAL WEATHER SERVICE city state time am/pm time_zone day mon dd yyyy	(Product Name or MND) (Issuing Office) (Issuance time/date)
"EARTHQUAKE FELT ____ BY ____ IN ____. ____ DAMAGE ____."	(REQUIRED ENTRY - Refer to Section 4.3.4.2)
THE NATIONAL EARTHQUAKE INFORMATION CENTER IN GOLDEN COLORADO (or WC/ATWC) INDICATED THE EARTHQUAKE MAGNITUDE (#) ON THE RICHTER SCALE WAS CENTERED AT (lat/lon) OR ABOUT (miles) (direction) OF (city, state). [Remainder of text]	
ANY FURTHER INFORMATION WILL BE MADE AVAILABLE WHEN IT IS RECEIVED FROM THE NATIONAL EARTHQUAKE INFORMATION CENTER IN GOLDEN COLORADO (OR WC/ATWC, as appropriate).	(REQUIRED ENTRY - End of Product)
\$\$	(UGC Delimiter)
Name/Initials/Forecaster ID	(Optional)

Figure 5. Generic format for an Updated Earthquake Report (Applicable to CONUS only).

4.4 Updates, Amendments, and Corrections. If additional information concerning damage or injuries within the area of the reporting office becomes available within 24 hours of the time of the initial message, updated EQR(s) should be sent to NEIC with this information.

4.4.1 WFOs in the Earthquake Felt Area. WFOs in the earthquake felt area and/or adjacent areas should broadcast on their NWRs and any other local system official information such as Richter Scale magnitude, precise location and time, and felt effects once it is received from the NEIC.

4.4.2 An Earthquake Alert - General Message (WMO Header SEXX02 KNEC, NWWS Header NECEQREQS, AWIPS Header EQREQS). An Earthquake alert is issued by the NEIC for an earthquake that has met one of the following criteria:

- (1) Richter Scale magnitude 6.5 or greater

- (2) caused or likely to have casualties or significant damage
 - (3) Richter Scale magnitude 4.5 or greater within the contiguous United States
 - (4) felt strongly enough in the United States to generate inquiries from the news media or public
 - (5) other events determined to be newsworthy by the NEIC duty geophysicist.
- The product includes a descriptive summary only and is intended for the news media and general public.

4.4.3 Other NEIC Bulletins. In addition to the general earthquake message listed in section 4.4.2, the NEIC issues other messages of interest:

Earthquake Alert - Scientific Message (WMO Header SEXX01 KNEC, NWWS Header NECEQREQB, AWIPS Header EQREQB) This is an information message about an earthquake that has met one of the following criteria: (1) magnitude 5.5 or greater, (2) caused or likely to have caused casualties or significant damage, (3) magnitude 4.5 or greater within the contiguous United States, (4) felt strongly enough in the United States to generate inquiries from the news media or public, or (5) other events determined to be of scientific interest by the NEIC duty geophysicist. The intended audience includes civil defense agencies, dam operators, power plants, railroads, insurance companies, relief agencies, schools, and scientists. The product contains the earthquake location, time of occurrence, magnitude, depth of focus, felt effects, and data used in the processing.

Quick Epicenter Determination (WMO Header SEXX03 KNEC, NWWS Header NECEQRQED, AFOS Header EQRQED). This is a global listing of earthquakes that have been located by the NEIC. The listing is issued daily and generally contains 10 to 20 events for the date 7 days prior to the current date.

Daily Summary of United States Earthquakes (WMO Header SEUS42 KNEC, NWWS Header NECEQRSUM, AWIPS Header EQRSUM) This is a listing of United States earthquakes that occurred in the last 30 hours, grouped into 6 regions: Southwest, West Central, Northwest, Eastern, Hawaii, and Alaska. This product is available on NWWS.

5. **Civil Emergency Message (product category CEM)**. Weather Forecast Offices (WFO) will issue CEMs to relay time critical, life or property saving, non-weather-related official emergency information from federal, state or local officials.

5.1 Mission Connection. In keeping with the expanding function of NWS dissemination systems as “all hazards” systems, the NWS allows the use of NWS dissemination systems by other government agencies, on a highly selective basis, to disseminate potential life-saving messages.

WFOs will collaborate with federal, state or local officials on requests to release CEMs over NWS dissemination systems. CEMs for events affecting all or a significant portion of a state should be coordinated through a single state authority, such as the public health department or emergency management agency. This coordination reduces the number of public messages,

provides a more coherent service to the public, and the NWS does not have to process messages from several cities and/or counties.

5.2 Issuance Guidelines. WFOs should develop and institute authentication procedures with state and local government officials to minimize the threat of a false or inappropriate release of a CEM.

5.2.1 Creation Software. WFOs should use the Watch Warning Advisory (WWA) software or other text editors to create CEMs.

5.2.2 Issuance Criteria. Messages disseminated as CEMs should comply with all the following criteria:

- a. PUBLIC SAFETY IS INVOLVED--Information to be disseminated will aid in reducing the loss of life or the substantial loss of property.
- b. OFFICIAL INFORMATION--The source of the information should be a government agency, federal, state, or local, whose information directly supports federal responsibilities concerning the protection of life and property.
- c. TIME CRITICAL--Event requires immediate public knowledge to avoid adverse impact.
- d. Other means of disseminating the information are not adequate to ensure rapid delivery of urgent information of an immediate threat or of significant importance to life and property.
- e. Information length and format is consistent with other NWS disseminated material.
- f. Information should be non-routine and infrequent.
- g. Information is complementary and not counterproductive to the NWS warning program.

5.2.3 Issuance Time. A CEM is a non-scheduled product and will be issued at the request of federal, state or local officials over NWS dissemination systems.

5.2.4 Valid Time. A CEM is valid for the time designated by the requesting federal, state or local official in the text message, when appropriate.

5.2.5 Product Expiration Time. The expiration time is designated by the requesting federal, state or local official and is placed in the UGC.

5.2.6 Event Expiration Time. The event expiration time is designated by the requesting federal, state or local official in the text message, when appropriate.

5.3 Technical Description. CEMs should follow the format and content described in this section.

5.3.1 Universal Geographic Code Type. Weather Forecast Offices (WFO) in the Alaska and Pacific Regions will use the (Z) form of the Universal Geographic Code (UGC), and WFOs in the remaining regions will use the (C) form of the UGC. The UGC for statements will include the county(ies) (zones) affected by the event.

5.3.2 Mass News Disseminator Broadcast Instruction line. The Mass News Disseminator (MND) broadcast instruction line will include one of the following phrases at the request of the authorizing agency:

"BULLETIN - EAS ACTIVATION REQUESTED",
"BULLETIN - IMMEDIATE BROADCAST REQUESTED",
"URGENT - IMMEDIATE BROADCAST REQUESTED"

Note: The use of "EAS ACTIVATION REQUESTED" or "IMMEDIATE BROADCAST REQUESTED" is at the discretion of state and local EAS committees.

The use of "BULLETIN" and "URGENT" follows convention established by the print and electronic media. These terms signify levels of dissemination urgency. The NWS only uses "BULLETIN" and "URGENT" in weather-related messages, but others may be used at the request of the authorizing agency. The complete list for non-weather related messages:

FLASH - Used only for world changing events, such as a Presidential assassination

BULLETIN - Used when the information is sufficiently urgent to warrant breaking into normal broadcast.

URGENT - Used when the information may wait until a stop-set to be broadcast.

REGULAR - Used when the information should be broadcast at regular news times.

HOLD - Do not broadcast at this time; may be upgraded or updated with a higher priority later.

5.3.3 Mass News Disseminator Product Type line. The MND will include the phrase: "CIVIL EMERGENCY MESSAGE" (Note: When new event codes are implemented for the Emergency Alert System and NWR SAME use, those new event titles will be used as the MND heading.)

5.3.4 CEM Content.

a. Headline. A headline statement may be included if appropriate.

b. Information Source. The lead-in to the non-NWS message will contain the source of the information in a format consistent with the following:

"The following message is transmitted at the request of (OTHER GOVERNMENT AGENCY) (remainder of text)."

- c. Content of Text. Detailed content is obtained from the civil authorities requesting agency. If the authorizing agency requests EAS activation, the word count of the message should be 200 words or less. The following information should be included as appropriate:
 - 1. type of hazard
 - 2. location of hazard
 - 3. actions to be taken by affected people
 - 4. where to get additional information
- d. Where demographics demand and logistics have been preplanned, the originator may provide text in multiple languages for NWS dissemination.

5.3.5 CEM Generic Format.

5.3.5.1 Issued by WFOs in the contiguous U.S. and Puerto Rico.

<u>Product Format</u>	<u>Description of Entry</u>
WOUSii cccc ddhhmm	(WMO Heading)
CEMxxx	(AWIPS ID)
stC001-002-003-004-005>015-ddhhmm-	(UGC: <u>C</u> & Product expiration time)
BULLETIN - EAS ACTIVATION REQUESTED	(MND Broadcast Instruction)
CIVIL EMERGENCY MESSAGE	(Product name or MND)
state EMERGENCY MANAGEMENT AGENCY st capital st	(Agency)
ISSUED BY NATIONAL WEATHER SERVICE city state	(NWS Issuing Office)
time am/pm time_zone day mon dd yyyy	(Issuance time/date)
"The following message is transmitted at the request of (OTHER GOVERNMENT AGENCY)"	(Information Source)
[Remainder of text]	
\$\$	(UGC Delimiter)
Name/Initials/Forecaster ID	(Optional)

Figure 6. Generic format for a CEM issued in the contiguous U.S. and Puerto Rico.

5.3.5.2 Issued by WFOs in Alaska or Pacific Region.

<u>Product Format</u>	<u>Description of Entry</u>
WOaaii cccc ddhhmm	<i>(WMO Heading)</i>
CEMxxx	<i>(AWIPS ID)</i>
stZ001-002-003-004-005>015-ddhhmm-	<i>(UGC: Z & Product expiration time)</i>
BULLETIN - IMMEDIATE BROADCAST REQUEST	<i>(MND Broadcast Instruction)</i>
CIVIL EMERGENCY MESSAGE	<i>(Product name or MND)</i>
state/city HEALTH DEPARTMENT state/city	<i>(Agency)</i>
ISSUED BY NATIONAL WEATHER SERVICE city	<i>(NWS Issuing Office)</i>
state	<i>(Issuance time/date)</i>
time am/pm time_zone day mon dd yyyy	<i>(Information Source)</i>
"The following message is transmitted at the request of (OTHER GOVERNMENT AGENCY)"	
[Remainder of text]	
\$\$	<i>(UGC Delimiter)</i>
Name/Initials/Forecaster ID	<i>(Optional)</i>

Figure 7. Generic format for a CEM issued in the Alaska or Pacific Region.

5.4 CEM Agreements.

5.4.1 Local Non-Weather-Related Emergencies Covered by Agreement. One statewide agreement with one agency should cover anticipated situations. Copies of these agreements and detailed procedures to carry out the agreements should be kept in the WFO operations area. Agreements to disseminate non-weather emergency information (including possible use of the warning alarm tones and NWR-SAME codes) will be approved by the RH.

5.4.2 Local Non-Weather-Related Emergencies Not Covered by Agreement. At times when events occur requiring the use of NWS dissemination systems by outside sources that are not covered by any agreements, the senior forecaster on duty should determine if the event presents a clear and immediate threat to lives and property in the state or County Warning Area. If the senior forecaster determines that the threat to life and property is real and the use of NWS dissemination systems could reduce the threat, dissemination of the information, as requested by locally recognized public safety officials, should be authorized after appropriate authentication. The regional headquarters should be contacted as soon as possible afterward with details of the event and to assess the need for a new agreement or addendum to cover future similar events. Examples of situations that would fall under this category are (1) a serious chemical spill or leak, (2) an explosion in a populated area, or (3) a dangerous nuclear or bio-hazard release, whether accidental or result of an act of terrorism.

5.5 Updates and Corrections. WFOs should release an updated CEM over NWS dissemination systems at the request of a federal, state or local official. No additional formatting

for an updated CEM is required. Proofread your CEM prior to sending message. If typographical errors are found after transmission, correct the error and retransmit the product using the following format:

WOUSii cccc ddhhmm CCx
CEMxxx
stC001-ddhhmm-

(Where, x=A,B,C...,X)

*(Z UGC Type for CEMs issued
in Alaska & Pacific Regions)*

BULLETIN - EAS ACTIVATION REQUESTED
CIVIL EMERGENCY MESSAGE...**CORRECTED**
state EMERGENCY MANAGEMENT AGENCY state capital st
ISSUED BY NATIONAL WEATHER SERVICE city state
time am/pm time_zone day mon dd yyyy

CORRECTED FOR TYPOGRAPHICAL ERROR

THE FOLLOWING MESSAGE IS TRANSMITTED AT THE REQUEST OF...

APPENDIX A - Non-Weather Related Emergency Product Examples

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1. **Introduction.** This section contains information and examples of non-weather related emergency models and products.

2. **Technical Description of Atmospheric Transport and Dispersion Models (ATD).**

2.1 **CAMEO - Computer-Aided Management of Emergency Operations.** CAMEO is a suite of software designed to help first responders and emergency planners plan for and quickly respond to chemical accidents. Within CAMEO, ALOHA (Areal Locations of Hazardous Atmospheres) is a computer program that uses meteorological input (usually a single point wind vector), along with physical property data from its extensive chemical library, to predict how a hazardous gas cloud might disperse in the atmosphere after an accidental chemical release. ALOHA can predict rates of chemical release from broken gas pipes, leaking tanks, and evaporating puddles, and can model the dispersion of both neutrally-buoyant and heavier-than-air gases.

ALOHA can display a "footprint" plot of the area downwind of a release where concentrations may exceed a user-set threshold level. It also displays plots of source strength (release rate), concentration, and dose over time. ALOHA accepts weather data transmitted from portable monitoring stations, and can plot footprints on electronic maps displayed in a companion mapping application, MARPLOT, as in the example below. Additional information on CAMEO/ALOHA is available at <http://response.restoration.noaa.gov/cameo/intro.html>

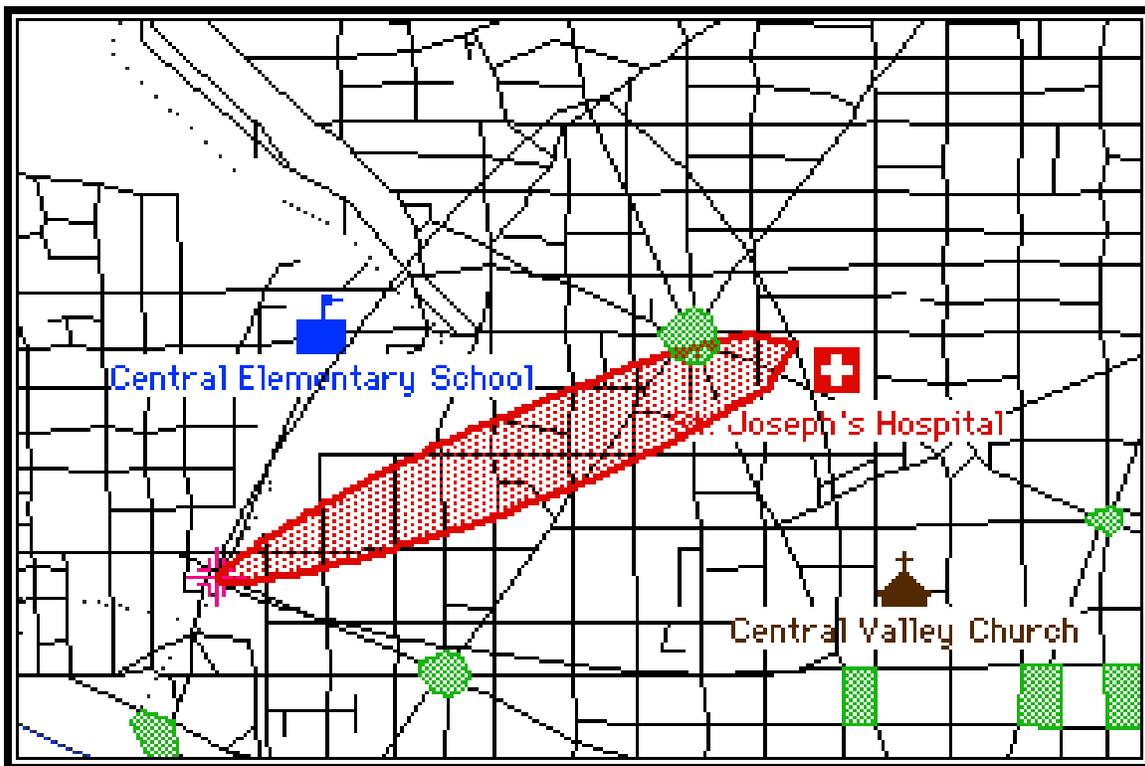


Figure A-1. Example of CAMEO/ALOHA output.

2.2 HYSPLIT - Hybrid Single-Particle Lagrangian Integrated Trajectory Model. The model, developed at the NOAA Air Resources Laboratory (ARL), is designed to support a wide range of simulations related to the long-range transport, dispersion, and deposition of pollutants. The applications can range from accidental radiological releases to the hazards presented to aircraft operations from volcanic ash eruptions, or routine air quality assessments such as those associated with emissions of anthropogenic pollutants. Simulation output results can vary from simple trajectories to more complex air concentration contour patterns. Calculations can be performed on archive or forecast meteorological data, or a combination of both.

The model calculation method is a hybrid between Eulerian and Lagrangian approaches. Advection and diffusion calculations are made in a Lagrangian framework following the transport, while concentrations are calculated on a fixed grid. The transport and dispersion of a pollutant are calculated by assuming the release of a single puff with either a Gaussian or top-hat horizontal distribution or from the dispersal of an initial fixed number of particles. The HYSPLIT approach is to combine both puff and particle methods by assuming a puff distribution in the horizontal and particle dispersion in the vertical direction. In this way, the greater accuracy of the vertical dispersion parameterization of the particle model is combined with the advantage of having fewer pollutant puffs to represent the horizontal distribution.

The model is now in operational use by the National Weather Service (NWS), with the National Centers for Environmental Prediction (NCEP) providing local forecast offices with dispersion forecasts routinely. Field forecasters regularly respond to requests from government and other emergency managers.

2.2.1 How to Run HYSPLIT. The model can be run on MS Windows PCs or UNIX workstations. The Windows executables, user manual, and other documentation, can be downloaded by registered users from the ARL website: <http://www.arl.noaa.gov/hysplit/>.

Registration is open to all government, commercial, and educational institutions at no cost. Certain government organizations may be able to request high-resolution model simulations directly from the NOAA NWS. In addition, the model can be run online using the ARL Real-time Environmental Applications and Display sYstem (READY) website (<http://www.arl.noaa.gov/ready/>), but at a reduced meteorological resolution compared to model runs done operationally by NCEP.

2.2.2 HYSPLIT Operational Support at NWS. HYSPLIT model simulations, driven by the current full resolution meteorological forecast data, are operationally supported 24x7 at NCEP. Backup/contingency operations support are in place. Outputs are posted to a secure web site, for access by NWS field forecasters and other registered users, or faxed if necessary. Two product streams are currently available:

- a. Nationwide, four times each day, linked to the Eta-12 km (backed up with AVN and MM-5 model outputs). Scenarios are produced four times each day for sample locations, for model evaluation and forecaster training.

- b. NWS Senior Duty Meteorologist (SDM) at NCEP will run HYSPLIT interfaced to the current Eta-12 predictions for specified locations, at the request of NWS field forecasters, 24x7.

Graphical outputs of NWS/NCEP HYSPLIT simulations are also available in GIS shapefile format.

2.2.3 When to Use HYSPLIT. The model is well suited for quick calculations of dispersion from pollutant point sources for situations where a quick turnaround is essential. The model's performance has been evaluated by comparing the calculations for a variety of different applications to real data observations, such as observed balloon trajectories, measured air concentrations of inert tracers, measured radioactive deposition, and satellite photographs of ash from volcanic eruptions. Various assessment studies have been conducted and summarized at <http://www.arl.noaa.gov/ss/transport/>. It is appropriate to use HYSPLIT:

- ▶ to address problems with source-to-receptor distances greater than 1/4 the resolution of the meteorological data driving the model simulation,
- ▶ to estimate source strengths based upon the ratio of the air concentration measurement to the model's unit emission air concentration prediction,
- ▶ to model the transport and dispersion of neutrally-buoyant materials
- ▶ to estimate air concentration or exposure over time at specific locations or areas downwind
- ▶ when temporal and/or spatial variations in meteorological conditions are expected
- ▶ when estimates of dry and/or wet deposition of the pollutant are required
- ▶ to get a forecast of plume position using the most recent NWS/NCEP forecast data.

2.2.4 When Not to Use HYSPLIT. HYSPLIT is not appropriate for:

- ▶ emissions containing excessive thermal or mechanical energy
- ▶ transport or dispersion at distances less than 500 meters from the source
- ▶ emissions containing dense gases
- ▶ emissions involving any chemical reactions more complex than radioactive decay
- ▶ or the effects of topography except as considered within the input meteorological data.

2.2.5 Entering Weather Information. Gridded fields of meteorological variables are required at regular temporal intervals. The time interval between fields should be constant for each defined grid. Meteorological data fields may be provided on a variety of different vertical coordinate systems. At a minimum, the model requires horizontal wind components, temperature, height or pressure, and the pressure at the surface. The precipitation field is required for wet deposition calculations. Meteorological data files in a format compatible for input to HYSPLIT are available through anonymous FTP from <ftp://gus.arlhq.noaa.gov/pub/>. Model calculations through the ARL READY web site automatically access all archive and forecast data files routinely saved by ARL. Access to the data from the PC version is configured in the HYSPLIT Graphical User Interface (GUI) and obtained automatically from the ARL server using FTP. Meteorological data may also be available by special arrangement with NOAA NWS and from other sources using standard GRIB decoding software provided with the model.

2.2.6 Estimating Model Parameters. The model can be run in batch mode with simulation parameters specified in a control file or the model can be run interactively through a GUI. The GUI, which sets all the default model simulation options, is available for both MS Windows and Unix platforms. The range of model configurations is more limited for the web site version. A model simulation requires, at a minimum, the emission location, time, duration, and height. Pollutant specific simulations are possible if more detailed characteristics, such as particle size, density, deposition velocity, emission rate, are known in advance. Typically, the model is run with a unit source strength emission unless more detailed information is available.

2.2.7 Typical Model Output. Two basic types of output are available: trajectories and air concentrations (Figures A-1 and A-2). Trajectories represent the transport pathway of a single pollutant particle while air concentration simulations model the transport and dispersion of a cluster of particles released over the duration of the emission. The latter therefore provides a more realistic and quantitative estimate. Post-processing graphics programs are integrated within the GUI for the display of trajectories and air concentrations as contoured time-series plots. Output averaging intervals and display heights are specified by the user. Conversion programs are available to convert the model results into files compatible with commercial GIS software, GrADS, and Vis5D.

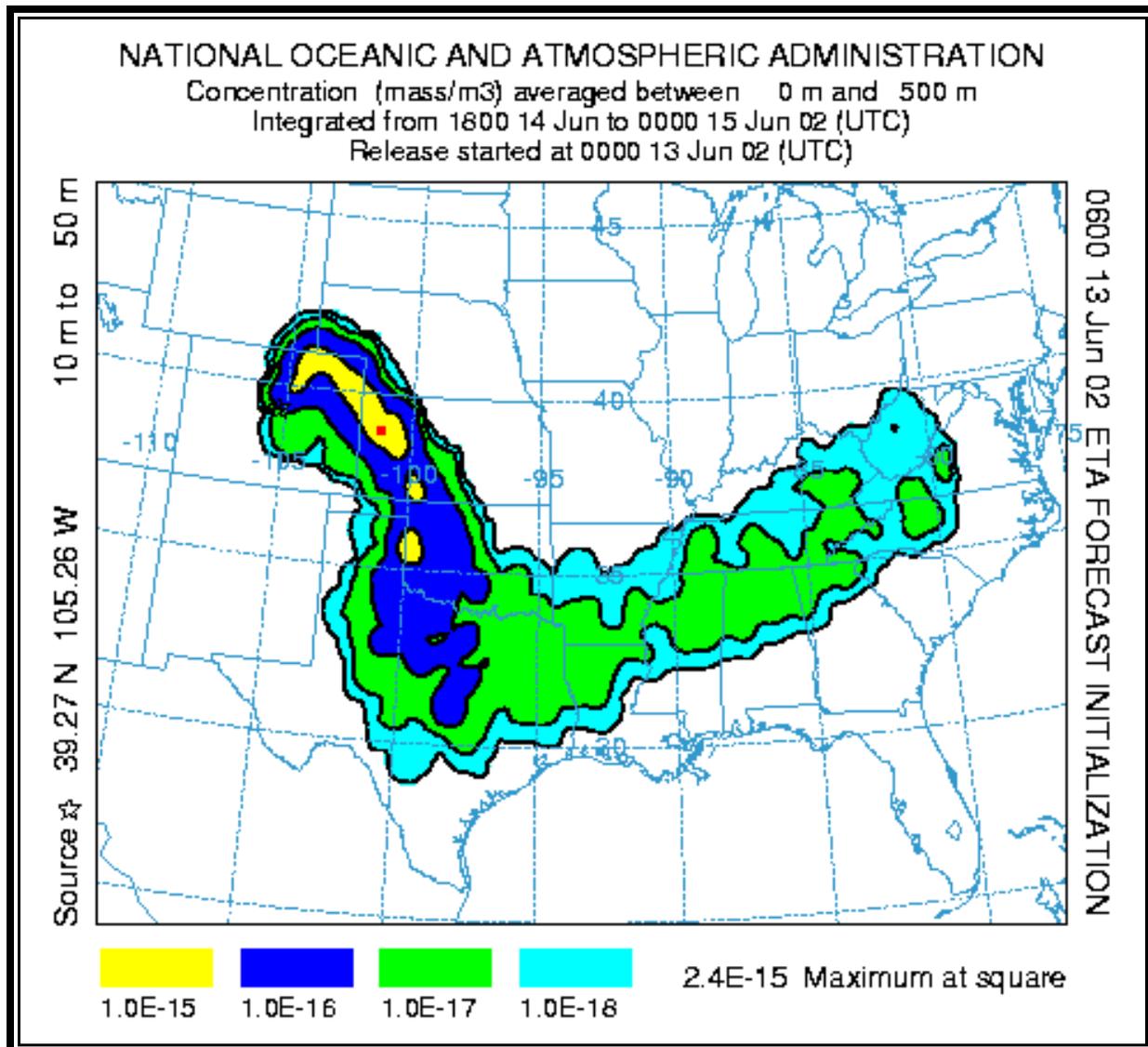


Figure A-3. Example of HYSPLIT Dispersion Plume.

The following is a description of what the output contains:

- ▶ Identification as a NOAA product.
- ▶ Indicates that the air concentration is averaged vertically between 10 meters and 500 meters and the units are in mass per cubic meter (mass/m³). Since the default Homeland Security (HS) emission rate is one unit over one hour, output units can be any multiplier of the input unit. Ground-level deposition maps, if available, are identified on this line with units of mass per square meter.
- ▶ The integration period for which the time integrated concentrations apply. All times are UTC (Universal Time Coordinate or Zulu time) and are indicated by the start and end of the integration period.
- ▶ The UTC time that the release started. The default HS scenario would be a release of one hour starting at this time.

- ▶ The latitude, longitude, and height of the release. Latitude and longitude are in degrees and hundreds of degrees. Single letter abbreviations are used for East, West, North and South. Source heights are in meters and indicate the height or layer of the release. A star is used to represent the source location on the map.
- ▶ Colors used for plotting the four contour intervals and their corresponding values. If the range of values on the map is less than eight orders of magnitude then the contour intervals are at factors of 10. If the range is greater, then the contour intervals are at factors of 100. Any values smaller than the smallest concentration range indicated are not plotted on the map.
- ▶ The maximum concentration or deposition value is indicated by the solid red square on the map.
- ▶ The time at which the forecast model was initialized at NCEP and an abbreviated name for the meteorological model.
- ▶ The yellow shaded area indicates where the normalized air concentrations exceed 10-13 units/m³. For example, if the actual pollutant emission rate were known, say 10⁷ particles, then the predicted 3-hour average air concentration in this region would be 10⁻⁶ particles/m³ (10⁻¹³ x 10⁷ = 10⁻⁶).

2.2.8 User Support. More detailed information about the model may be obtained from the ARL User's Manual [http://www.arl.noaa.gov/data/models/hysplit4/win95/user man.pdf](http://www.arl.noaa.gov/data/models/hysplit4/win95/user%20man.pdf). Limited interactive dispersion model training is available through the READY web site <http://www.arl.noaa.gov/slides/ready>

3. Fallout Winds product for the contiguous U.S.

FDUS01 KWNO 211548

DATA BASED ON 211200Z

NERN US

JFK 1108 0908 0908	BOS 1210 1210 1209	AUG 1311 1311 1410
CAR 1507 1708 1809	PLB 1209 1207 1104	ALB 1109 1008 0906
BUF 0509 0409 0508	IPT 0707 0608 0709	PIT 0411 0611 0513
BAL 0808 0709 0810	CRW 0611 0613 0517	LOU 0614 0518 0422

SERN US

RIC 0709 0810 0812	HAT 0807 0908 1010	RDU 0809 0911 0812
TRI 0713 0715 0618	BNA 0716 0619 0624	JAN 0718 0719 0722
BHM 0815 0717 0720	ATL 0814 0715 0618	CAE 0911 0811 0713
ILM 0809 0911 0812	JAX 1109 1008 0909	TLH 1010 0810 0711
TPA 1207 1007 0906	MIA 1507 1405 1204	MOB 0814 0714 0716

MSY 0814 0714 0715

S CNTRL US

HOU 0716 0716 0816	SAT 0715 0714 0813	CRP 0713 0712 0712
BRO 0611 0611 0710	LRD 0612 0612 0711	DRT 0714 0712 0810
HOB 1011 1209 1109	AMA 1117 1316 1215	ABI 0817 0915 1112
DAL 0820 0820 1017	SHV 0720 0722 0821	MEM 0718 0622 0725
LIT 0720 0723 0822	OKC 0820 1118 1219	ALS 1519 1515 1413
DEN 1620 1519 1518	GCK 1315 1418 1419	HLC 1312 1518 1420

NWSI 10-518 OCTOBER 1, 2002

ICT 0915 1215 1319 MKC 0715 0912 1215 SGF 0620 0718 1017
STL 0518 0520 0617
N CNTRL US
IND 0514 0419 0421 ORD 0415 0319 0317 CLE 0411 0511 0414
FNT 0311 0413 0217 SSM 0111 0112 3615 GRB 0213 0117 0115
DBQ 0315 0315 0410 DSM 0512 0808 1209 ONL 1411 1515 1518
RAP 1618 1620 1622 ABR 1508 1611 1613 MSP 0110 0105 1002
INL 3410 3208 2906
NWRN US
GFK 3401 2003 1906 DIK 1616 1619 1620 GGW 1620 1520 1521
BIL 1620 1519 1519 GTF 1518 1518 1417 DLN 1516 1515 1414
FCA 1417 1416 1314 GEG 1414 1312 1210 SEA 1007 0807 0708
PDX 1105 0805 0607 OTH 0803 0604 0507 RBL 1303 1102 0703
LKV 1405 1204 0905 IMB 1407 1105 0907 BOI 1611 1508 1306
CPR 1621 1619 1520 BFF 1619 1620 1521
SWRN US
SLC 1612 1611 1509 PIH 1613 1612 1511 RKS 1617 1616 1615
GJT 1616 1512 1612 FMN 1514 1510 1509 ABQ 1412 1410 1309
BCE 1509 1608 1708 LAS 1705 1805 1804 ELY 1609 1707 1505
EKO 1609 1607 1405 TPH 1706 1805 1503 RNO 1605 1603 1203
SFO 1802 1901 0201 FAT 1804 1803 1601 SBA 1903 2002 1901
DAG 1804 1804 1803 SAN 1703 1802 1702 YUM 1603 1603 1603
PRC 1605 1604 1604 TUS 1704 1703 1603 ELP 1305 1404 1304
CANADA
609 1409 1409 1610
714 1407 1707 1806
731 0407 0108 0108
749 3512 3413 3315
852 3503 2802 2304
863 1516 1517 1518
872 1419 1420 1419
882 1217 1115 1013
892 0911 0811 0611

4. **Earthquake Report Examples.**

4.1 **Initial Earthquake Report.** This example is an initial Earthquake Report without precise quantitative information. Note the ‘...PRELIMINARY’ on the MND line and the mandatory statement in the final section.

SEUS61 KBOX 201108
EQRBOX

EARTHQUAKE REPORT...PRELIMINARY
NATIONAL WEATHER SERVICE TAUNTON MA
708 AM EDT APR 20 2002

AN EARTHQUAKE WAS FELT FROM PORTIONS OF EASTERN NEW YORK STATE THROUGH MANY PORTIONS OF NEW ENGLAND AT APPROXIMATELY 655 AM EDT SATURDAY APRIL 20 2002.

THERE ARE NO KNOWN REPORTS OF DAMAGE AS REPORTED TO THE NATIONAL WEATHER SERVICE AND LIKEWISE FROM EARLY CURSORY REPORTS FROM EMERGENCY MANAGEMENT AGENCIES.

INFORMATION RELEASED IN THIS STATEMENT IS PRELIMINARY. UPDATES... INCLUDING RICHTER SCALE MAGNITUDE...WILL BE PROVIDED AS MORE INFORMATION BECOMES AVAILABLE FROM THE NATIONAL EARTHQUAKE INFORMATION CENTER IN GOLDEN COLORADO.

\$\$

DRAG

4.2 **Updated Earthquake Report.** This example is an updated Earthquake Report with quantitative information such as Richter Scale, precise location, time, etc. Note the ‘...UPDATED’ on the MND line and the final section changes from the preliminary report, above.

SEUS64 KLUB 310410
EQRLUB

EARTHQUAKE REPORT...UPDATED
NATIONAL WEATHER SERVICE AMARILLO TX
1010 PM CST SAT MAR 30 2002

AN EARTHQUAKE WAS MODERATELY FELT BY SEVERAL PEOPLE ON THE EXTREME NORTH SIDE OF AMARILLO SHORTLY BEFORE 9 PM CST THIS SATURDAY EVENING. NO DAMAGE HAS BEEN REPORTED.

THE NATIONAL EARTHQUAKE INFORMATION CENTER IN GOLDEN COLORADO CONFIRMED THE EARTHQUAKE MAGNITUDE WAS 2.6 ON THE RICHTER SCALE AND THE EPICENTER WAS AT 35.3N...101.8W...OR ABOUT 5 MILES NORTH NORTHEAST OF AMARILLO TEXAS. THE EARTHQUAKE OCCURRED AT 854 PM CST THIS SATURDAY EVENING.

ANY FURTHER INFORMATION WILL BE MADE AVAILABLE WHEN IT IS RECEIVED FROM THE NATIONAL EARTHQUAKE INFORMATION CENTER IN GOLDEN COLORADO.

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ANDRADE

5. CEM Examples.

5.1 State Coordinated Generic CEM.

WOaaii cccc ddhhmm

CEMxxx

stC001-192200-

*(Z UGC Type for CEMs issued in
Alaska & Pacific Regions)*

BULLETIN - EAS ACTIVATION REQUESTED

CIVIL EMERGENCY MESSAGE

ANY STATE GOVERNORS OFFICE STATE CAPITAL ANY STATE

ISSUED BY NATIONAL WEATHER SERVICE city state

100 PM EDT THU JUL 19 2002

...STATE OF EMERGENCY DECLARED IN ANY TOWN...

THE FOLLOWING MESSAGE IS TRANSMITTED AT THE REQUEST OF GOVERNOR ANY NAME DUE TO THE RELEASE OF AN AIRBORNE TOXIN.

ANY STATE GOVERNOR ANY NAME HAS DECLARED A STATE OF EMERGENCY IN ANY TOWN DUE TO THE RELEASE OF AN AIRBORNE TOXIN. DR. SMITH... STATE HEALTH COMMISSIONER...RECOMMENDS THAT YOU STAY INDOORS WITH WINDOWS CLOSED AND AWAIT FURTHER INSTRUCTION FROM CIVIL AUTHORITIES. ANYONE NEEDING HELP OR INFORMATION SHOULD CALL THEIR LOCAL COUNTY/CITY HEALTH DEPARTMENT OR THE STATE HEALTH HOTLINE AT 555-111-2222. TUNE TO LOCAL/CABLE MEDIA FOR FURTHER INFORMATION ON THIS EMERGENCY.

R.J. WASHINGTON

DIRECTOR

STATE OFFICE OF EMERGENCY MANAGEMENT

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5.2 County Level CEM.

WOUS44 KLCH 141559
CEMLCH
LAC019-141844-

BULLETIN - EAS ACTIVATION REQUESTED
CIVIL EMERGENCY MESSAGE
CALCASIEU PARISH EMERGENCY MANAGEMENT LAKE CHARLES LA
ISSUED BY NATIONAL WEATHER SERVICE LAKE CHARLES LA
1045 AM CDT THU JUN 14 2001

...SHELTER IN PLACE WARNING NEAR THE CITGO CHEMICAL PLANT SOUTH OF
SULPHUR...

THE FOLLOWING MESSAGE IS TRANSMITTED AT THE REQUEST OF THE
CALCASIEU PARISH OFFICE OF EMERGENCY MANAGEMENT DUE TO TOXIC GAS
RELEASE.

THE CALCASIEU PARISH OFFICE OF EMERGENCY PREPAREDNESS ISSUED A
SHELTER IN PLACE WARNING. THERE HAS BEEN A RELEASE OF BUTADIENE
FROM CITGO CHEMICAL PLANT. THE DIRECTION OF THE WIND IS FROM THE
SOUTHWEST. THE WIND SPEED IS ABOUT 10 MILES PER HOUR. AS A
PRECAUTIONARY MEASURE...PEOPLE NEAR THE TOWN OF SULFUR SHOULD SEEK
SHELTER IN THE FOLLOWING AREA: HIGHWAY 108 FROM I-10 TO BAYOU D'INDE
ROAD AND ONE MILE RADIUS OF THIS AREA.

SHELTER IN PLACE WARNING ACTIONS:

1. GO INSIDE
2. CLOSE ALL DOORS AND WINDOWS
3. TURN OFF ALL VENTILATION SYSTEMS
4. TUNE TO LOCAL NEWS MEDIA FOR FURTHER INFORMATION.

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5.3 Multi-County Coordinated CEM

WOUS44 KHGX 091940
CEMHOU
TXC373-407-101100-

BULLETIN - EAS ACTIVATION REQUESTED
CIVIL EMERGENCY MESSAGE...FLOOD EVACUATION
POLK/ SAN JACINTO COUNTY EMERGENCY MANAGEMENT LIVINGSTON/ COLD
SPRING TX
ISSUED BY NATIONAL WEATHER SERVICE HOUSTON/GALVESTON TX
240 PM CDT SAT JUN 9 2001

THE FOLLOWING MESSAGE IS TRANSMITTED AT THE REQUEST OF THE POLK
AND SAN JACINTO COUNTY OFFICE OF EMERGENCY MANAGEMENT DUE TO
IMMINENT FLOODING.

BASED ON NATIONAL WEATHER SERVICE WARNINGS...THE MAYORS OF POLK
AND SAN JACINTO COUNTIES RECOMMEND EVACUATION OF THE FOLLOWING
LOCATIONS IMMEDIATELY.

THE SUBDIVISIONS OF...RIVER LAKE ESTATES...CREEKWOOD...SIESTA
COUNTRY...HOOT OWL HOLLOW...HOLIDAY LAKES...TAYLOR LAKES...WELLS
LANDING...SPORTSMANS RETREAT...LAKE LIVINGSTON REEL AND ROD...
BENTWOOD BEND...TRIPLE CREEK MARINA...AND THE IMMEDIATE AREA OFF OF
FM 2969 IN POLK COUNTY...AND CAMILLA TWIN HARBORS IN SAN JACINTO
COUNTY....AND ANY PERSONS IN LOW LYING OR FLOOD PRONE AREAS ALONG
THE TRINITY RIVER AND SURROUNDING CREEKS.

EVACUEES ARE ADVISED THAT THE AMERICAN RED CROSS HAS OPENED A
SHELTER AT THE GOODRICH HIGH SCHOOL IN POLK COUNTY. AN ADDITIONAL
SHELTER HAS BEEN OPENED AT THE FIRST BAPTIST CHURCH IN CAMILLA.

IN ADDITION...THE TRINITY RIVER WILL BE CLOSED TO ALL BOAT TRAFFIC
EFFECTIVE IMMEDIATELY.

CONTACT NUMBERS ARE THE POLK COUNTY EMERGENCY MANAGEMENT AT
(123)456-7890 OR (890)567-1234.

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APPENDIX B - Definitions for Non-Weather Related Emergency Terms

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1. Introduction. This section contains definitions of non-weather related emergency terms used in non-weather related emergency products.
2. Earthquake Data. Specific data and computed information about an earthquake, such as phase arrival times and amplitudes, hypocentral locations in geographic coordinates, magnitudes, etc.
3. Earthquake Magnitude. A measure of the size of an earthquake, obtained by measuring the amplitude of seismic waves on seismographs. The earthquake magnitude is related to the amount of energy released at the source of the earthquake. The first instrumental earthquake-magnitude scale was invented by Dr. Charles F. Richter.
4. FD. Abbreviation for upper-air fallout data. It is normally used in conjunction with the upper-air fallout data code.
5. Fallout. The process or phenomenon of the fallback to Earth's surface of particles contaminated with radioactive material from a radioactive cloud. The term is also applied in a collective sense to the contaminated particulate matter itself.
6. Fallout Wind Vector (FD Wind). A wind that is an integration of the appropriate forecast layer winds, integrated from the 100 mb level (about 50,000 feet) to the ground, adjusted for varying rates of fall of particles and the elevation of the station. A fallout wind vector defines the around position after 3 hours fall of a particle originally at 100 mb.
7. Fallout Wind Area. An area of the Earth's surface that is contaminated with radiological particulate matter that has fallen from high levels after 3 hours. The area is computed from fallout wind vectors using streamline analysis and other techniques. It is FEMA's responsibility to produce these fallout wind areas.
8. Macroseismic Information. Information on earthquake effects that are observed without the aid of seismic instruments, such as where the earthquake was felt, how strongly the earthquake was felt (e.g., weakly, moderately, strongly), how many people felt the earthquake (e.g., a few, many, or all), damage caused by the earthquake, and casualties caused by the earthquake (Reference Table 1, Modified Mercalli Intensity (Damage) Scale of 1931).
9. Modified Mercalli Intensity. A number between 1 and 12 that characterizes the severity of ground shaking at a given location by considering the effects of the shaking on people, man-made structures, and the landscape (see Table x). Intensities will be assigned to most communities in which the earthquake was felt. Intensity values may differ depending on effects in each community.

10. Richter Scale. Developed in 1935 by Charles F. Richter of the California Institute of Technology as a mathematical device to compare the size of earthquakes. The magnitude of an earthquake is determined from the logarithm of the amplitude of waves recorded by seismographs. Adjustments are included for the variation in the distance between the various seismographs and the epicenter of the earthquakes.

On the Richter Scale, magnitude is expressed in whole numbers and decimal fractions. For example, a magnitude 5.3 might be computed for a moderate earthquake, and a strong earthquake might be rated as magnitude 6.3. Because of the logarithmic basis of the scale, each whole number increase in magnitude represents a tenfold increase in measured amplitude; as an estimate of energy, each whole number step in the magnitude scale corresponds to the release of about 31 times more energy than the amount associated with the preceding whole number value.